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Spatio-temporal variability of natural organic matter in Lancang River: concentration, sources and destination

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Natural organic matter (NOM) played an important role in the riverine and global carbon cycle. In order to evaluate the impact of river discharge and anthropogenic activities on the spatio-temporal variability of NOM content and sources in Lancang River, China, a comprehensive study was conducted in two years from the head to the leave-boundary section. As results, the DOC value ranged among 0.91-2.80 mg/L, with sharp decrease in the middle reaches and downstream. While the SOC value significantly enhanced along the water flow, varied from 0.06% to 3.54%. The isotopic composition of organic carbon (δ13C) suggested that predominant contribution of NOM is C3 plants in the upper reach, algae and soil organic matter in the middle reach, and aquatic plants in the downstream. EEM-PARAFAC results proved that NOM in Lancang River is mainly terrestrial organic carbon, while in situ microbial transformed NOM is very low. Moreover, the sharp increase of dissolved CO2 concentration in the lower reaches confirmed the strong respiration of microorganisms due to the higher DO and water temperature, thus resulted in the significantly different fluctuations of DOC and SOC.